AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A holographic optical element for measuring at least one of the dimension and position of an object with aid of a deflected laser beam generated by a monochromatic and coherent laser light source that sweeps across an angular range to produce a fan-shaped reference wave front, the element comprising:

at least two interference patterns formed on the holographic optical element, wherein each interference pattern is created through simultaneous exposure of the element to the fan-shaped reference wave front generated by the monochromatic and coherent laser light source and a parallel partial wave front generated by the same monochromatic and coherent laser light source and hitting the element at a different angle than the reference wave front, wherein the number of parallel partial wave fronts used for the exposure of the element corresponds to the number of interference patterns, and wherein if the parallel partial wave fronts are virtually extended through the holographic optical element, ~~they~~ the parallel partial wave fronts intersect behind the element in a center of a measuring field.

2. (Original) The element of claim 1, wherein the at least two interference patterns comprises at least three different interference patterns.

3. (Original) The element of claim 2, wherein the at least two parallel partial wave fronts are all located in a single plane.

4. (Withdrawn) The element of claim 3, wherein an angle between the reference wave front and a common plane for the parallel partial wave fronts is 40 to 50° and a bisector of the angle is positioned perpendicular on a plane for the holographic optical element.

5. (Original) The element of claim 1, wherein the element includes a plurality of sections, and each section has a respective one of the interference patterns and the sections are spatially separated from another section.

6. (Original) The element of claim 1, wherein the at least two interference patterns at least partially overlap one another.

7. (Original) A measuring arrangement, comprising a transmitting part for generating a laser beam and a receiving part, wherein both parts include a holographic optical element and the holographic optical element of at least the transmitting part comprises the holographic optical element according to claim 1, said arrangement being adapted to be used to measure at least one of the dimension and position of an object with the aid of the laser beam, which is deflected so that it sweeps across a specific angular range.

8. (Original) The arrangement of claim 1, wherein the holographic optical element is a holographic film plate.

9. (Original) A method of measuring at least one of a dimension and position of an object with a laser beam that sweeps across a specific angular range, comprising utilizing the holographic element of claim 1.

10. (Original) The method according to claim 9, wherein the object comprises one of a cable, profile, and a pipe.

11. (Original) A device for measuring at least one of the dimension and position of an object, the device comprising:

a transmitter part for generating a monochromatic light beam and a receiver part, wherein the transmitter part and the receiver part each include a holographic optical element, wherein the transmitter part includes means for deflecting the light beam in the transmitter part through an angular region onto the holographic optical element in the transmitter part, and wherein at least one of said holographic elements comprises the holographic element according to claim 1.

12. (New) A measuring apparatus for simultaneously measuring the dimension and/or position of an object from multiple positions and/or angles, the measuring apparatus comprising:

a holographic optical element;

a monochromatic and coherent laser light source that creates a laser beam that sweeps across an angular range to produce a fan-shaped reference wave front on the holographic optical element; and

a plurality of beam splitters that split the laser beam into two or more parallel partial wave fronts projected onto the holographic optical element, each parallel partial wave front hitting the holographic optical element at a different angle than the reference wave front to create an interference pattern on the holographic optical element;

wherein if the parallel partial wave fronts are virtually extended through the holographic optical element, the parallel partial wave fronts intersect behind the element in a center of a measuring field.